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EXAMINER

MANOHARAN, MUTHUSWAMY GANAPATHY

ART UNIT

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06/05/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/724,383

Applicant(s)

WON, CHANG-BAI

Examiner

Muthuswamy G. Manoharan

Art Unit

2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-8,10-20 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-8,10-20 and 22-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claim 1, applicant recites, **"a rotational control device for applying pressure to the first hinge member such that the application of pressure to the first hinge member is directly transferred to the coupling hinge member"** and in claim 18, applicant further recites, **"a rotational control device for controlling pressure applied to the first hinge member, such that application of pressure to the first hinge member is directly transferred to the coupling hinge member"**.

Since the control device 150 and first hinge member 110 are connected through male screw threads 113 and female screw threads 152a (Figure 8 and Paragraph [0048]). Therefore, rotation control device cannot apply pressure (Normal force per unit area) to the first hinge member as claimed by the applicant.

Further, claim 1 recites, "wherein the rotation preventing surfaces are formed on the outer circumferential surfaces of each of the first second and coupling hinge members, such that the first, second and coupling hinge members can slidably move in and out of said first, second hinge housings **without any obstruction** and subject to the biasing force exerted by the spring and the rotation control device". Figure, 8 shows that the spring is being blocked from being pushed out. Therefore, there is an obstruction on the second hinge housings.

The claims 3-8, and 10-20 are also rejected, since the claims are dependent on rejected claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,5-8,10, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtsuka (US 5923751) in view of Furuta et al. (hereinafter Furuta) (US 5467477).

Regarding **claim 1**, Ohtsuka teaches a mobile communication terminal comprising: a first body (item 5 in Figure 1); a second body (item 1 in figure 1); and a

hinge apparatus, which rotatively couples the first body to the second body, the hinge apparatus comprising (Figure 2):

- a first hinge unit comprising

- a first hinge housing formed approximate to a side edge of the first body (item 2 in Figure 2); and

- a first hinge member inserted into the first hinge housing (items 2 and 19 in Figure 2);

- a second hinge unit (item 13 in Figure 2);

- a second hinge housing formed approximate to a bottom edge of the second body (item 6 in Figure 1)

- a second hinge member inserted into the second hinge housing (item 13 and item 6 in Figure 2); and

- a spring disposed adjacent to the second hinge member in the second hinge housing (item 18 in Figure 2);

- a coupling hinge member disposed between the first and second hinge units (item 17 of Figure 2)

- a rotation control device (item 20 in Figure 2) for applying pressure to the first hinge member, such that application of pressure to the first hinge member is directly transferred to the coupling hinge member and the second hinge member respectively, to slidably move the first, second and coupling hinge member inside the first and second hinge housings, such that the rotation control device in cooperation with a biasing force of the spring positions the coupling hinge member inside the first hinge

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housing, and such that the rotation control device in a second rotation state in cooperation with the biasing force of the spring positions the coupling hinge member inside the second hinge housing (Col. 3, lines 39-59); and

a shaft disposed in the second hinge housing (item 14 in Figure 2), wherein the shaft passes through the spring, second hinge member and coupling hinge member (item 8 in Figure 2),

wherein rotation-preventing surfaces are formed on a outer circumferential surface of each of the first, second, and coupling hinge members (items 19a, 17a, 13a in Figure 2), such that the rotation-preventing surfaces prevent the first, second and coupling hinge members from rotating inside the first and second hinge housings when said rotation preventing surfaces engage an inner circumferential surface of said first and second hinge housings (items 19a, 17a and 13a prevent the first, second and coupling hinge members from rotating inside first and second hinge housings 2 and 6; figure 2), and

wherein the rotation preventing surfaces are formed on the outer circumferential surfaces of each of the first, second and coupling hinge members, such that the first, second, and coupling hinge members can slidably move in and out of said first and second hinge housings without any obstruction and subject to the biasing force exerted by the spring and the rotation control device (items 2b and 6b of the first and second housings allow coupling hinge members to slide through the slots 2b and 6b without any obstructions; Figure 2).

Ohtsuka did not teach specifically rotation control device in a first rotation state. and a second rotation state. However, Furuta teaches in an analogous art wherein the rotation control device in a first rotation state and second rotation state (Col. 4, lines 46-60). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to have the rotation control device in a first rotation state and second rotation state as an alternate way of providing axial movement of the hinge member both inward and outward.

Regarding **claim 5**, Ohtsuka teaches the mobile communication terminal of claim 1, wherein guiding surfaces are formed on opposing surfaces of the first hinge member and coupling hinge member (items 19b and 17b in Figure 2).

Regarding **claim 6**, Ohtsuka teaches the mobile communication terminal of claim 5, wherein a groove, which is formed on the guiding surface of the first hinge member (item 17c in Figure 2), engages a corresponding protrusion (item 19b in Figure 2) formed on the guiding surface of the coupling hinge member.

Regarding **claim 7**, Ohtsuka teaches the mobile communication terminal of claim 5, wherein a groove, which is formed on the guiding surface of the coupling hinge member, engages a corresponding protrusion formed on the guiding surface of the first hinge member (items 17c and 19b in Figure 2).

Regarding **claim 8**, Ohtsuka teaches the mobile communication terminal of claim 3, wherein a convex portion and a concave portion are each formed on opposing surfaces of the coupling hinge member and the second hinge member such that the convex and concave portions of the coupling hinge member correspond to the concave

and convex portions, respectively, of the second hinge member (items 17b in Figure 2 and 17c in Figure 8).

Regarding **claim 10**, Ohtsuka teaches the mobile communication terminal of claim 1, wherein first and second hinge contact surfaces are formed on an inner surface of each of the first and second hinge housing members, respectively, to engage the rotation-preventing surfaces of the first and second hinge members, respectively, to prevent rotation of the first and second hinge members, respectively (items 2b, 6b in Figure 2 and 8).

Regarding **claim 18**, Ohtsuka teaches a folding type mobile communication terminal, wherein a hinge apparatus rotatively couples a first body to a second body, the hinge apparatus comprising:

- a first hinge housing formed approximate to a side edge of the first body (item 6 in Figure 2);

- a first hinge member inserted into the first hinge housing (item 6 in Figure 2);

- a second hinge housing formed approximate to a bottom edge of the second body (item 6 in Figure 2);

- a second hinge member inserted into the second hinge housing ;

- a coupling hinge member disposed between the first and second hinge members (item 17 in Figure 2) ;

- a spring disposed adjacent to the second hinge member in the second hinge housing (items 14 in Figure 2);

a shaft disposed in the second hinge housing, wherein the shaft passes through the spring, second hinge member and coupling hinge member (item 8 in Figure 2);

a rotation control device (item 20 in Figure 2) for controlling pressure to the first hinge member, such that application of pressure to the first hinge member is directly transferred to the coupling hinge member and the second hinge member respectively, to slidably move the first, second and coupling hinge member inside the first and second hinge housings, such that the rotation control device in cooperation with a biasing force of the spring positions the coupling hinge member inside the first hinge housing, and such that the rotation control device in cooperation with the biasing force of the spring positions the coupling hinge member inside the second hinge housing (Col. 3, lines 39-59); and

a rotation preventing surfaces formed on a circumferential surface of each of the first second and coupling hinge members (items 19a,17a,13a in Figure 2); and

first and second hinge contact surfaces formed on an inner surface of each of the first and second hinge housing members, respectively, wherein the first and second hinge contact surfaces engage the rotation-preventing surfaces of the first and second hinge members, respectively, to prevent rotation of the first and second hinge members, respectively (items 2b, and 6b in Figure 2)

wherein the rotation preventing surfaces are formed on the outer circumferential surfaces of each of the first, second and coupling hinge members, such that the first, second, and coupling hinge members can slidably move in and out of said first and second hinge housings without any obstruction and subject to the biasing force exerted

by the spring and the rotation control device (items 2b and 6b of the first and second housings allow coupling hinge members to slide through the slots 2b and 6b without any obstructions; Figure 2).

Ohtsuka did not teach specifically rotation control device in a first rotation state. and a second rotation state. However, Furuta teaches in an analogous art wherein the rotation control device in a first rotation state and second rotation state (Col. 4, lines 46-60). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to have the rotation control device in a first rotation state and second rotation state as an alternate way of providing axial movement of the hinge member both inward and outward.

Regarding **claim 19**, Ohtsuka teaches the folding type mobile communication terminal of claim 18, wherein the hinge apparatus further comprises: guiding surfaces formed on opposing surfaces of the first hinge member and coupling hinge member, wherein a groove is formed on the guiding surface of the first hinge member and engages a corresponding protrusion formed on the guiding surface of the coupling hinge member (items 19b and 17c in Figure 2).

Regarding **claim 20**, Ohtsuka teaches the folding type mobile communication terminal of claim 18, wherein a convex portion and a concave portion are each formed on opposing surfaces of the coupling hinge member and the second hinge member such that the convex and concave portions of the coupling hinge member correspond

to the concave and convex portions, respectively, of the second hinge member (items 16a and 17c in Figure 8).

Claims 11-17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtsuka (US 5923751) in view of Furuta et al. (hereinafter Furuta) (US 5467477) and further in view of Wahl et al. (hereinafter Wahl) (US 6101676).

Regarding **claim 11**, Ohtsuka further teaches the mobile communication terminal of claim 1, wherein the rotation control device comprises: a cap receiving portion formed on an inner surface of the first hinge housing (item 20 in Figure 2). Neither Ohtsuka nor Wahl did not teach specifically a cap protrusion formed on an outer circumferential surface of the rotation control cap, wherein the cap receiving groove receives the cap protrusion; a female screw thread formed on an inner circumferential surface of the rotation control cap; and a male screw thread formed on a circumferential surface of the first hinge member, wherein the male screw thread engages the female screw thread of the rotation control cap. However, Wahl teaches in an analogous art a rotation control cap (item 700 in Figure 7); a cap receiving groove formed on the cap receiving portion; a cap protrusion formed on an outer circumferential surface of the rotation control cap, wherein the cap receiving groove receives the cap protrusion (item 700 in Figure 7; Col. 3, lines 65-67); a female screw thread formed on an inner circumferential surface of the rotation control cap (Figure 4); and a male screw thread formed on a circumferential surface of the first hinge member,

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wherein the male screw thread engages the female screw thread of the rotation control cap (Figure 4). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to have a rotation control cap; a cap receiving groove formed on the cap receiving portion; a cap protrusion formed on an outer circumferential surface of the rotation control cap, wherein the cap receiving groove receives the cap protrusion; a female screw thread formed on an inner circumferential surface of the rotation control cap; and a male screw thread formed on a circumferential surface of the first hinge member, wherein the male screw thread engages the female screw thread of the rotation control cap as an alternate device to perform the function such as sliding movement in an axial direction.

Regarding **claim 12**, Ohtsuka further teaches the mobile communication terminal wherein the rotation control cap comprises an exposed portion to serve as a receiving point for a user (Figure 1). Ohtsuka did not teach specifically receiving point for torque applied by a user. However, Furuta teaches in an analogous art receiving point for torque applied by a user (Col. 2, lines 50-67, col. 3, lines 1-9). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to have a receiving point where torque can be applied by a user as an alternate way of performing the function such as sliding movement in an axial direction.

Regarding **claim 13**, Ohtsuka in view of Furuta teaches all the particulars of the claim except wherein the exposed portion comprises gripping means. However, Wahl teaches in an analogous art wherein the exposed portion comprises gripping means (Figure 7). Therefore, it would be obvious to one of ordinary skill in the art at the time of

invention to have wherein the exposed portion comprises gripping means to avoid slipping. This is well known in the art.

Regarding **claim 14**, Ohtsuka in view of Furuta teaches all the particulars of the claim except wherein the gripping means comprises plurality of knurls. However, Wahl teaches in an analogous art wherein the gripping means comprises plurality of knurls (Figure 7). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to have wherein the gripping means comprises plurality of knurls to avoid slipping. This is well known in the art.

Regarding **claim 15**, Ohtsuka further teaches the mobile communication terminal of claim 11, further comprising a protrusion formed on each of the inner surfaces of the first hinge housing and control cap such that the protrusion formed on the inner surface of the first hinge housing prevents lateral movement of the control cap towards the second hinge housing (item 20a and 2c in Figure 2).

Regarding **claim 16**, Ohtsuka teaches the mobile communication terminal of claim 1, wherein a plurality of terminal manipulation devices is disposed on an inner surface of the first body (Figure 1).

Regarding **claim 17**, Ohtsuka teaches the mobile communication terminal of claim 1, wherein a display screen is disposed on an inner surface of the second body (Figure 1).

Regarding **claim 22**, Ohtsuka in view of Furuta teaches the folding type mobile communication terminal of claim 18, wherein the rotation control device (item 20 in

Figure 2) comprises: a cap receiving portion formed on an inner surface of the first hinge housing (item 2 in Figure 2).

Ohtsuka did not teach specifically a rotation control cap having an exposed portion to serve as a receiving point for torque applied by a user; a cap receiving groove formed on the cap receiving portion; a cap protrusion formed on an outer circumferential surface of the rotation control cap, wherein the cap receiving groove receives the cap protrusion; a female screw thread formed on an inner circumferential surface of the rotation control cap; and a male screw thread formed on a circumferential surface of the first hinge member, wherein the male screw thread engages the female screw thread of the rotation control cap.

However, Wahl teaches in an analogous art wherein a rotation control cap having an exposed portion to serve as a receiving point for torque applied by a user; a cap receiving groove formed on the cap receiving portion; a cap protrusion formed on an outer circumferential surface of the rotation control cap, wherein the cap receiving groove receives the cap protrusion; a female screw thread formed on an inner circumferential surface of the rotation control cap; and a male screw thread formed on a circumferential surface of the first hinge member, wherein the male screw thread engages the female screw thread of the rotation control cap (items 202b in Figure 4, Col. 3, lines 65-67). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to use a rotation control cap having an exposed portion to serve as a receiving point for torque applied by a user; a cap receiving groove formed on the cap receiving portion; a cap protrusion formed on an outer circumferential surface of

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the rotation control cap, wherein the cap receiving groove receives the cap protrusion; a female screw thread formed on an inner circumferential surface of the rotation control cap; and a male screw thread formed on a circumferential surface of the first hinge member, wherein the male screw thread engages the female screw thread of the rotation control cap. This is clearly a design choice, for producing axial displacement either by pressing the control cap or by turning the screw using torque.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtsuka (US 5923751) in view of Wahl et al. (hereinafter Wahl) (US 6101676).

Regarding **claim 24**, Ohtsuka teaches a method of unfolding a folding type mobile communication terminal to a desired opening angle, the method comprising the steps of:

a rotation control device in a predetermined direction so that a first hinge member is forced away from an outer edge of the terminal, wherein a coupling hinge member is displaced into a second hinge housing (Abstract);

lifting a first body of the terminal, which is rotatively coupled to a second body, so that a protrusion on the coupling hinge member engages a groove on the first hinge member (Col. 3, lines 39-59); and

releasing the first body of the terminal at the desired opening angle, wherein an elastic force generated by a spring housed in a second hinge housing presses the coupling hinge member against the first hinge member, thereby creating a frictional force to maintain the desired opening angle (Col. 5, lines 1-13).

Ohtsuka did not teach specifically, rotating a rotation control device. However, Wahl teaches in an analogous art rotating a rotation control device (item 700 in Figure 7; Col. 3, lines 65-67). Therefore, it would be obvious to one of ordinary skill in the art at the time of invention to use the method by rotating a rotation control device as an alternate method for providing sliding movement in an axial direction.

Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over AP (applicant admitted prior art) in view of Wahl et al. (hereinafter Wahl) (US 6101676).

Regarding **claim 23**, AP teaches a method of unfolding a folding type mobile communication terminal to a maximum opening angle, the method comprising the steps of: lifting a first body of the terminal, which is rotatively coupled to a second body, so that a convex portion of the coupling hinge member passes over a convex portion of a second hinge member; and releasing the first body of the terminal so that a spring housed in a second hinge housing expands and forces the convex portion of the coupling hinge member to completely pass over the convex portion of the second hinge member, thereby completely unfolding the terminal (Figure 2). AP did not teach specifically rotating a rotation control device in a predetermined direction so that a first hinge member is forced towards an outer edge of the terminal, wherein a coupling hinge member is displaced into a first hinge housing. However, Wahl teaches in an analogous art wherein rotating a rotation control device in a predetermined direction so

that a first hinge member is forced towards an outer edge of the terminal, wherein a coupling hinge member is displaced into a first hinge housing (Figure 4). This modification provides a method of providing axial displacement by rotating a rotation control device.

Regarding **claim 24**, AP teaches a method of unfolding a folding type mobile communication terminal to a desired opening angle, the method comprising the steps of:

lifting a first body of the terminal, which is rotatively coupled to a second body, so that a protrusion on the coupling hinge member engages a groove on the first hinge member; and

releasing the first body of the terminal at the desired opening angle, wherein an elastic force generated by a spring housed in a second hinge housing presses the coupling hinge member against the first hinge member, thereby creating a frictional force to maintain the desired opening angle (Figure 4).

AP did not teach specifically a rotation control device in a predetermined direction so that a first hinge member is forced away from an outer edge of the terminal, wherein a coupling hinge member is displaced into a second hinge housing. However, Wahl teaches in an analogous art a rotation control device in a predetermined direction so that a first hinge member is forced away from an outer edge of the terminal, wherein a coupling hinge member is displaced into a second hinge housing (Figure 4). This modification provides a method of providing axial displacement by rotating a rotation control device.

Response to Arguments

Applicant's arguments with respect to claims 1, 5-8, 10-20, and 22-24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Muthuswamy G. Manoharan whose telephone number is 571-272-5515. The examiner can normally be reached on 7:00AM-2:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eng George can be reached on 571-272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


GEORGE ENG
SUPERVISORY PATENT EXAMINER